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Title of the Invention: Platinum Alloy For Ornaments
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CLAIMS

1. A platinum alloy for ornaments which is obtained by adding 0.01-5 w/o misch metal and at least one from among palladium, iridium, ruthenium, rhodium, gold, silver, copper, nickel and cobalt in a total of 1-15 w/o, to 80-95 w/o platinum.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a platinum alloy for ornaments.

Pt-Pd (5-15 w/o) alloy has been the major material conventionally used as a platinum alloy for ornaments. However, although Pt-Pd (5-15 w/o) alloy has superior workability, it has low mechanical strength and especially hardness and is therefore prone to scratches and dents during polishing, while it also fails to readily exhibit glossiness. Even when used as a finished product it is prone to damage, and in the case of a jeweled ring, for example, the caulking section holding the jewel becomes loosened and the jewel may fall out. Also, since Pt-Pd (5-15 w/o) alloy does not flow particularly well during casting, it does not adequately reproduce fine die patterns, and generation of mold cavities is quite common. Moreover, crystal grains become coarser under the high temperature of brazing, resulting in notably impaired mechanical strength.

The present invention has been accomplished with the aim of overcoming the drawbacks of Pt-Pd (5-15 w/o) alloy, and its object is to provide a platinum alloy for ornaments which increases mechanical strength and especially hardness, enhances melt flow for improved casting and also increases mechanical

strength at high temperatures.

The platinum alloy for ornaments of the invention is obtained by adding 0.01-5 w/o misch metal and at least one from among palladium, iridium, ruthenium, rhodium, gold, silver, copper, nickel and cobalt in a total of 1-15 w/o, to 80-95 w/o platinum.

The reason for adding misch metal to the platinum alloy for ornaments of the invention is to improve the mechanical strength and especially the hardness, while also improving the casting property. In particular, the palladium, iridium, ruthenium, rhodium, gold, silver, copper, nickel and cobalt are added from the viewpoint of corrosion resistance and cost but are insufficient for enhancing the hardness of the platinum, whereas addition of misch metal can vastly increase the hardness; palladium, iridium, ruthenium, rhodium, gold, silver, copper, nickel and cobalt also fail to enhance the casting property of platinum, and particularly addition of ruthenium, copper and nickel are added in an amount of a few percent worsens the casting property of platinum, whereas the added misch metal acts as a deoxidizing agent to eliminate generation of mold cavities during casting and results in a satisfactory melt flow, thereby enhancing the casting property.

Furthermore, addition of misch metal prevents coarseness of the crystal grains under the high temperature of brazing and the like, to help prevent reduction in mechanical strength.

The reason for limiting the amount of addition of the misch metal to 0.01-5 w/o is that there is no improvement in the mechanical strength, i.e. hardness, and casting property with an amount of less than 0.01 w/o, while an amount of greater than 5 w/o notably impairs the workability. Also, the reason for limiting the total amount of addition of one or more from among palladium, iridium, ruthenium, rhodium, gold, silver, copper, nickel and cobalt to 1-15 w/o is that the expected effects in terms of corrosion resistance and cost cannot be achieved at less than 1 w/o, while an amount of greater than 15 w/o notably

impairs the casting property.

Specific examples and prior art examples will be described in order to clearly show the effect of the platinum alloy for ornaments according to the present invention.

Platinum alloys for ornaments according to Examples 1-7 and platinum alloys for ornaments according to Prior Art Examples 1-3, having the component compositions listed in the left column in the table below were annealed and then measured for hardness, and the alloys were also melted and injected into a ring casting die, and after hardening, reproducibility of the fine die pattern and generation of mold cavities were examined, yielding the results shown in the right columns of the table.

	Component composition (w/o)											Hardness after annealing	Fine die pattern reproducibility	Mold cavity generation
	Pt	Pd	Ir	Ru	Rh	Au	Ag	Cu	Ni	Co	Misch metal			
Example 1	95						4.7				0.3	145HV	◎	low
Example 2	90	5							4.8		0.2	145HV	◎	low
Example 3	90		9.9								0.1	150HV	o	low
Example 4	90	5		5							0.05	160HV	o	low
Example 5	85	7.5			2	5					0.5	140HV	◎	low
Example 6	85	7.5						5			2.5	175HV	o	low
Example 7	80	1.5								2	3.0	155HV	◎	low
Prior Art Ex. 1	95	5										65HV	o	normal
Prior Art Ex. 2	90	10										75HV	o	normal
Prior Art Ex. 3	85	7.5						7.5				140HV	x	high

As clearly shown in the table, the platinum alloys for ornaments according to the Examples exhibited higher hardness after annealing, higher reproducibility of the fine die pattern and in particular extremely lower generation of mold cavities, compared to the platinum alloys for ornaments according to the Prior Art Examples.

As explained above, a platinum alloy for ornaments according to the present invention has high mechanical strength and especially hardness, satisfactory melt flow properties for casting, adequate reproducibility of fine die patterns and especially very low generation of mold cavities and excellent casting properties, and may therefore be considered an innovative platinum alloy for ornaments which can substitute for conventional platinum alloys for ornaments.